

# PATENT ABSTRACTS OF JAPAN

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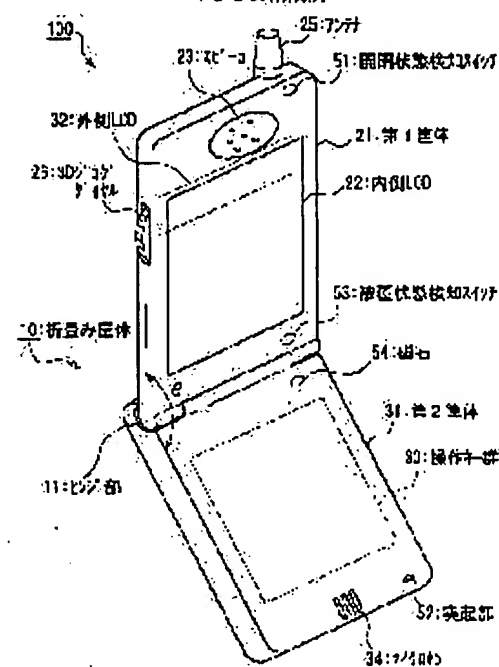
## (54) FOLDABLE PORTABLE ELECTRONIC APPARATUS

### (57)Abstract:

PROBLEM TO BE SOLVED: To miniaturize a display part which is used in the close state and to reduce the power consumption in the close state.

SOLUTION: This apparatus is provided with an inside LCD 22 which is provided on the inside turned-in face of a foldable casing 10 in the close state, an outside LCD 32 which has a display area smaller than that of the inside LCD 22 and is provided on the opposite side of the inside turned-in face in the close state, an open/close state detection switch 51 and a covering state detection switch 53 which detect the open/close state of the foldable casing 10, and a CPU which controls display so as to display the same preliminarily selected information on the inside LCD 22 and the outside LCD 32 for a prescribed time on the basis of detection results of the open/close state detection switch 51 and the covering state detection switch 53.

本発明に係る第1実施形態としての折畳式携帯電話機器100の構成例



## LEGAL STATUS

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application converted registration]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the example of a configuration of the \*\*\*\* type portable telephone machine 100 as the 1st operation gestalt concerning this invention.

[Drawing 2] It is the block diagram showing the example of a configuration of the control system 150 in the tatami type portable telephone machine 100 on that occasion.

[Drawing 3] It is the flow chart which shows the example (at the time of an open operation) of the tatami type portable telephone machine 100 of operation on that occasion.

[Drawing 4] It is the flow chart which shows the example (at the time of fold-up actuation) of the tatami type portable telephone machine 100 of operation on that occasion.

[Drawing 5] It is a perspective view at the time of the (b) closed state at the time of (a) open condition which shows the example of a condition of the tatami type portable telephone machine 100 on that occasion.

[Drawing 6] It is the perspective view showing the example of a configuration of the \*\*\*\* type portable telephone machine 200 as the 2nd operation gestalt.

[Drawing 7] It is the block diagram showing the example of a configuration of the control system 250 in the tatami type portable telephone machine 200 on that occasion.

[Drawing 8] It is the block diagram showing the example of the tatami type portable telephone machine 200 of operation on that occasion.

[Drawing 9] It is a perspective view at the time of the (b) closed state at the time of (a) open condition which shows the example of a condition of the tatami type portable telephone machine 200 on that occasion.

[Description of Notations]

10 ... A fold-up case, 21 ... The 1st case (the 1st case), 22 ... Inside LCD (the 1st display) 25 ... 3D jog dial (control unit), 31 ... The 2nd case (the 2nd case), 32 ... LCD (the 2nd display), 40,240 ... CPU (control means), 51 [ ... \*\*\*\* type portable telephone machine of the 2nd operation gestalt ] ... A switching condition detection switch (condition detection means), 53 ... A covering condition detection switch (condition detection means), 100 ... The \*\*\*\* type portable telephone machine of the 1st operation gestalt, 200

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[Translation done.]

## \* NOTICES \*

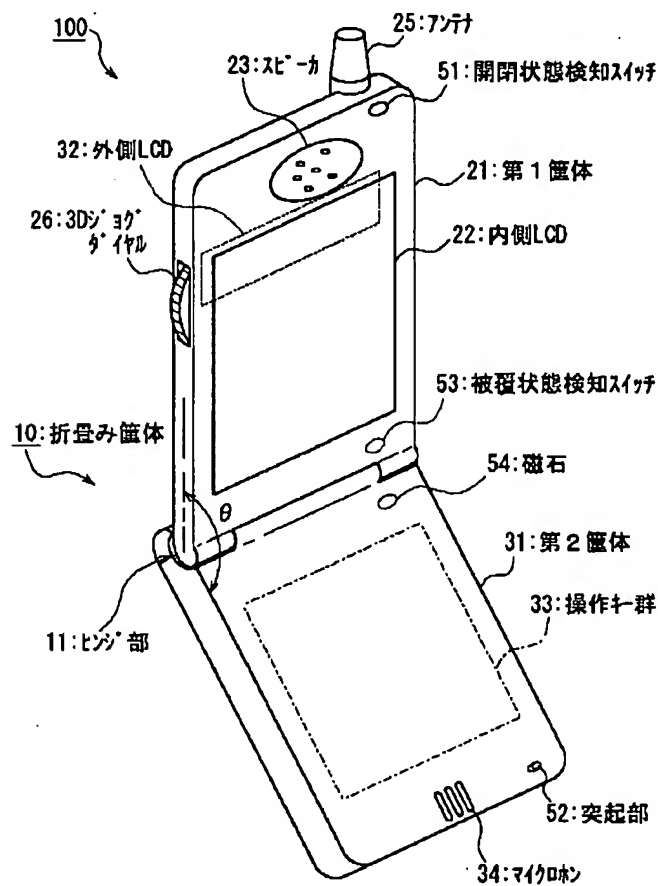
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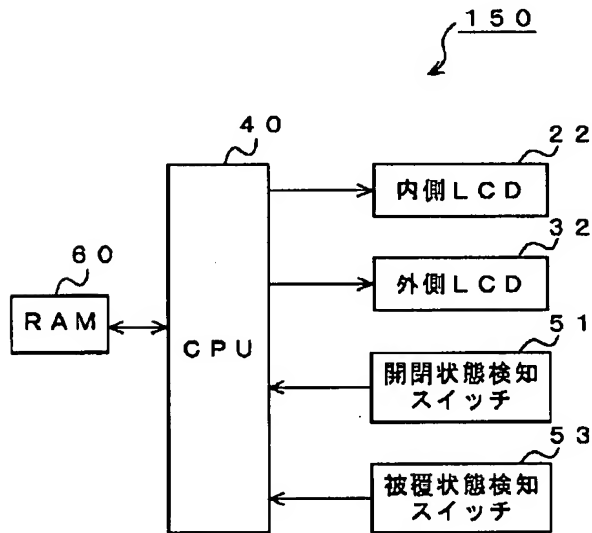
## DRAWINGS

[Drawing 1]

本発明に係る第1実施形態としての折畳式携帯電話機器  
100の構成例

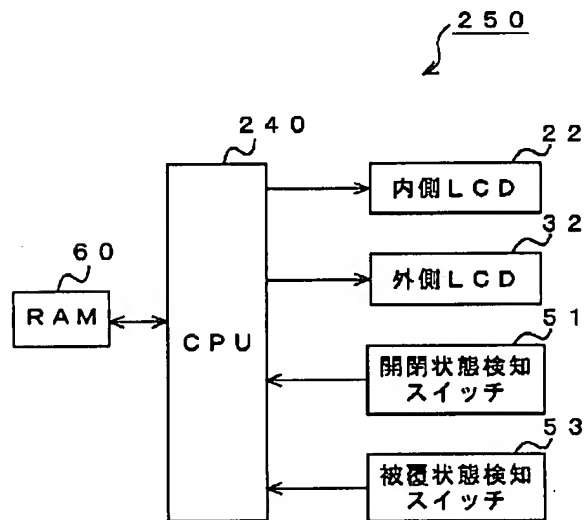
[Drawing 2]

折畳式携帯電話機器 100 における  
制御システム 150 の構成例



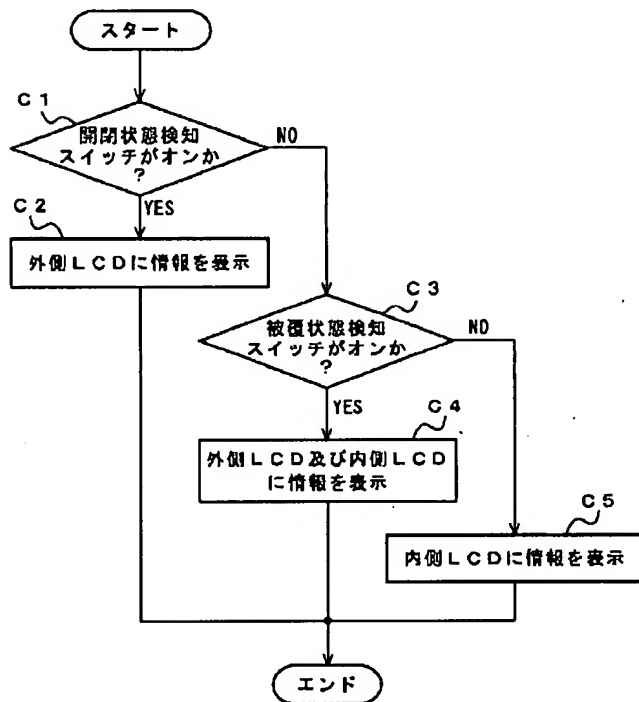
[Drawing 7]

折畳式携帯電話機器 200 における  
制御システム 250 の構成例



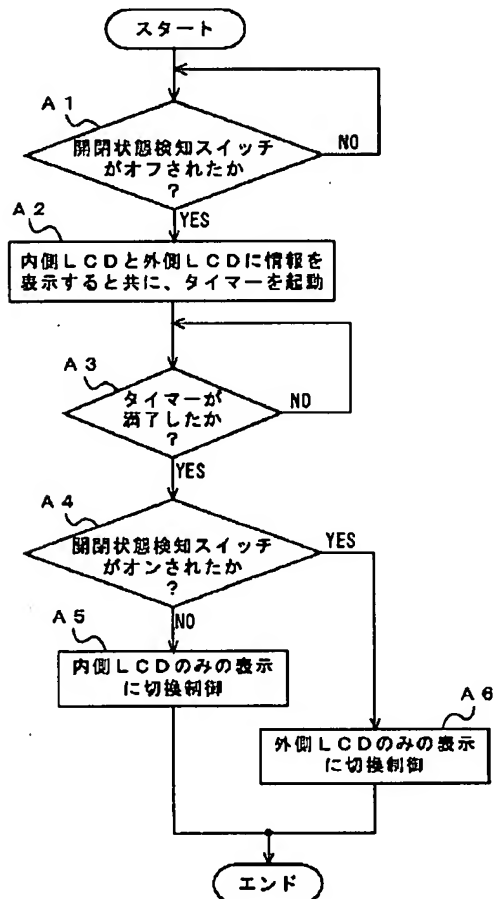
[Drawing 8]

# 折り畳式携帯電話機器 200 の動作例

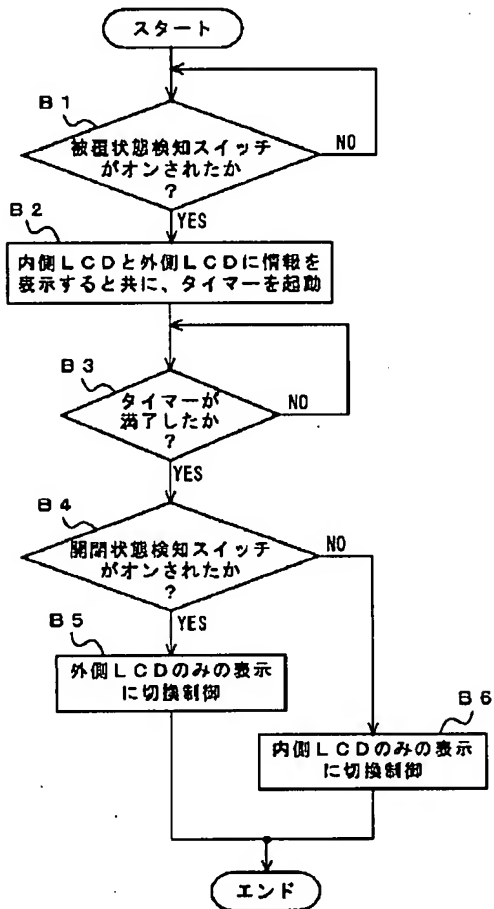


[Drawing 3]

## 折り畳式携帯電話機器 100 の動作例 (開操作時)

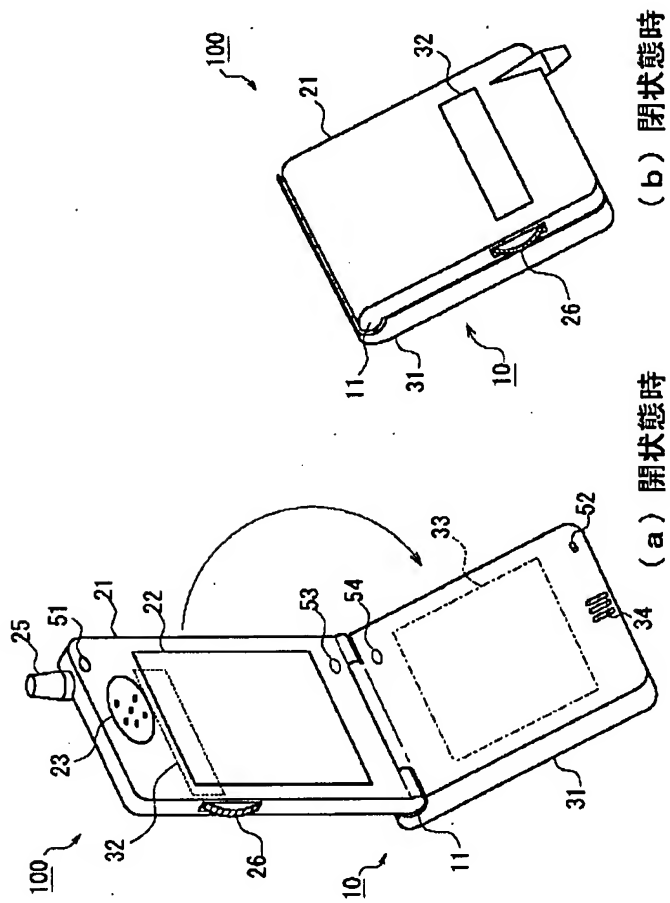


[Drawing 4]

折畳式携帯電話機器 100 の動作例  
(折畳み操作時)

[Drawing 5]

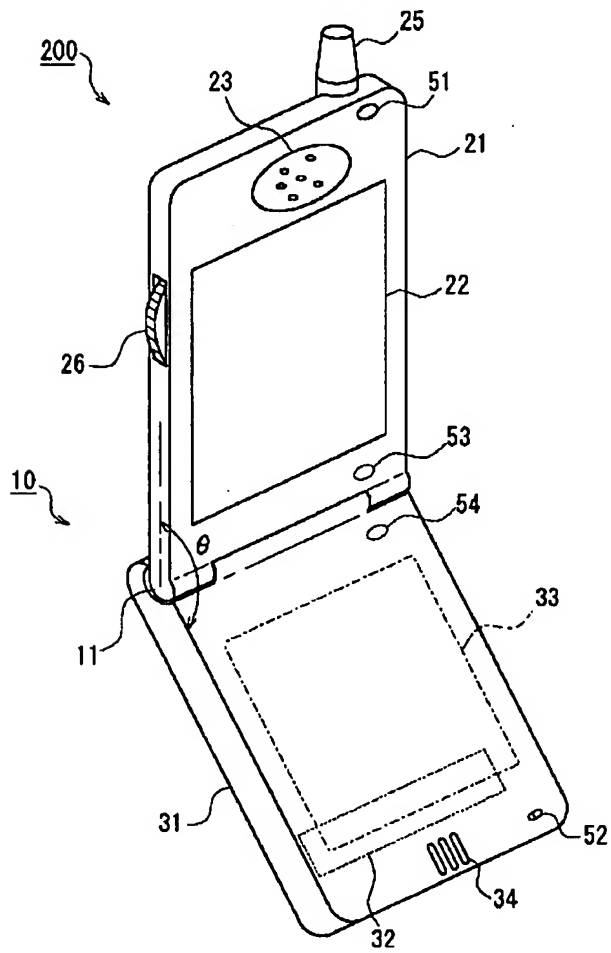
折畳式携帯電話機器 100 の状態例



[Drawing 6]

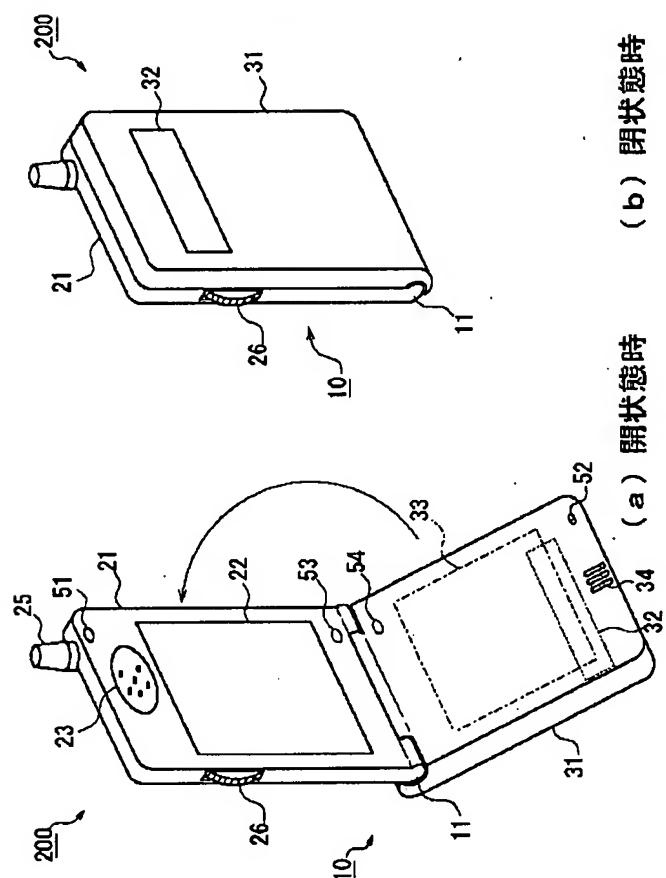


第2実施形態としての折り畳み携帯電話機器  
200の構成例



[Drawing 9]

折畳式携帯電話機器 200 の状態例



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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a \*\*\*\* type portable electronic device with a foldable folding case.

[0002] A control means is prepared in the inside insertion side at the time of a closed state in detail at a folding case with the 1st display and the 2nd display of the viewing area smaller than the 1st display to the opposite side of the inside insertion side. A control means is made to perform a display control so that only a predetermined period may display the same preselected information on the 1st display and 2nd display based on the detection result of a condition detection means to detect the switching condition of a fold-up case. It enables it to reduce the power consumption in a closed state.

[0003]

[Description of the Prior Art] In recent years, the \*\*\*\* type portable electronic device which can use the size as a compact by folding up has won popularity. The \*\*\*\* type portable telephone machine used as an example of this \*\*\*\* type portable electronic device etc. is constituted possible [ folding of that case ], for example. And it is made as [ improve / by folding up a case at the time (at the time of receipt) of intact, and making it a closed state / portability ] so that operability can be improved by opening a case at the time of use and changing into an open condition.

[0004] Here, the \*\*\*\* type portable telephone machine as a \*\*\*\* type portable electronic device concerning the conventional method has the folding case with which it was a hinge region etc., and the 1st case and the 2nd case of for example, a rectangular parallelepiped configuration countered in transverse planes mutually, and were connected possible [ folding ]. The actuation key group for inputting the telephone number, control information, etc. is prepared in the transverse plane of this 2nd case. The liquid crystal display (it is called LCD below Liquid Crystal Display;) is prepared in the transverse plane of the 1st case, and the information inputted by the actuation key group, the received information are displayed on LCD in this transverse plane of the 1st case.

[0005] Moreover, LCD is prepared also in the tooth back of the 1st case, and the information displayed also on LCD in transverse plane of the 1st case or LCD on this tooth back of the 1st case and the same information are displayed. Furthermore, the switch mechanism turned on when folded up, and the control section electrically connected with this switch mechanism are prepared in the fold-up case. This control section displays information on LCD in transverse plane of the 1st case, while the switch mechanism is turned on, and while the switch mechanism is turned off, it performs control which displays information on LCD on the tooth back of the 1st case.

[0006] By this, to the 2nd case, when the 1st case is in an open condition, a switch mechanism is turned off, and information is displayed on LCD in transverse plane of the 1st case. And to the 2nd case, when the 1st case is a closed state, a switch mechanism is turned on and information is displayed on LCD on the tooth back of the 1st case. Thus, of course, when it folds up and the case is opened, also when folded up, it is made as [ check / a user / information ].

[0007]

[Problem(s) to be Solved by the Invention] However, according to the \*\*\*\* type portable telephone machine of the conventional method, there is a problem that the information displayed on LCD in transverse plane of the 1st case and LCD on the tooth back of the 1st case consumes power remarkably to eye backlash which is the same amount of information, and serves as hindrance of power-saving at it at the time of the closed state of a fold-up case.

[0008] Then, this invention is created in order to solve the above-mentioned problem, and it aims at offering the \*\*\*\* type portable electronic device which enabled it to reduce the power consumption in a closed state while it constitutes the display used by the closed state small.

[0009]

[Means for Solving the Problem] While an above-mentioned technical problem has a viewing area smaller than the 1st display prepared in the inside insertion side in the folding case of a closed state, and the 1st display in a \*\*\*\* type portable electronic device with a foldable folding case The 2nd display prepared in the opposite side of the inside insertion side of a closed state, and a condition detection means to detect the switching condition of a fold-up case, It is solved by the \*\*\*\* type portable electronic device characterized by having the control means which carries out a display control so that only a predetermined period may display the same preselected information on the 1st display and 2nd display based on the detection result of a condition detection means.

[0010] According to this invention, the 2nd display of the viewing area to the opposite side of the inside insertion side with the 1st display smaller than the 1st display is prepared in the inside insertion side in the folding case of a closed state. And a condition detection means folds up, the switching condition of a case is detected, and it is based on the detection result of this condition detection means. Since a display control is carried out by the control means so that only a predetermined period may display the same preselected information on the 1st display and 2nd display based on the detection result of a condition detection means The 1st display used in an open condition can be made to display only required information on the 2nd display used in much information at the time of a closed state.

[0011] Therefore, the power consumption in a closed state can be reduced. In addition, since the information can be continued and viewed by the display of another side even if it is the case where the display folded up and while information was displayed is covered with closing motion of a case, it can fold up without missing the displayed information, and a case can be opened and closed.

[0012]

[Embodiment of the Invention] Hereafter, the gestalt of 1 operation of the \*\*\*\* type portable electronic device concerning this invention is explained to a detail, referring to a drawing.

[0013] (The 1st operation gestalt) Drawing 1 is the perspective view showing the example of a configuration of the \*\*\*\* type portable electronic device as this invention \*\*\*\*\* 1 operation gestalt. With this operation gestalt, a control means is prepared in the inside insertion side at the time of a closed state at a folding case with the 1st display and the 2nd display of the viewing area smaller than the 1st display to the opposite side of that inside insertion side. A control means is made to perform a display control so that only a predetermined period may display the same preselected information on the 1st display and 2nd display based on the detection result of a condition detection means to detect the switching condition of a fold-up case. It enables it to reduce the power consumption in a closed state.

[0014] The \*\*\*\* type portable electronic device concerning this invention is the \*\*\*\* type portable telephone machine 100 with the case of a \*\*\*\* type which applies, for example to a portable communication terminal device etc., and is shown in very suitable drawing 1. This \*\*\*\* type portable telephone machine 100 is equipped with the Internet use function, the music regenerative function, etc. as well as the message function as a telephone. The \*\*\*\* type portable telephone machine 100 has the closing motion-type folding case 10, and this folding case 10 consists of the 1st case 21, the 2nd case 31, and a hinge region 11.

[0015] These 1st cases 21 and the 2nd case 31 have the shape of a rectangle bodily shape of the abbreviation same size, and the lower limit of 1st case 21 longitudinal direction and the upper limit of 2nd case 31 longitudinal direction are connected free [ rotation ] by the hinge region 11. Thus, the 1st case 21 and the 2nd case 31 counter in transverse planes mutually, and are made as folding is possible.

Here, the closing motion angle  $\theta$  of the 1st case 21 and the 2nd case 31 is designed so that it may become for example,  $0 \leq \theta \leq 150$  [°] extent.

[0016] And the actuation key group 33 is formed in the transverse plane of the 2nd case 31. Call origination is directed in this actuation key group 33, or the jog pointer for carrying out a cursor advance, scrolling of a screen, etc. to the ten key for inputting the telephone directory key, the telephone number, and the alphabetic character for searching the clear back key for closing the speaking key for answering at the time of arrival of the mail and a message and telephone directory data, the key for music regenerative functions, and the Internet utilization time etc. is arranged. The microphone 34 is formed in the case side near the lower part of the actuation key group 33, and it is used in order to input the voice which a user utters.

[0017] Moreover, the inside LCD 22 which is a liquid crystal display is formed in the transverse plane of the 1st case 21, and when the folding case 10 is a closed state, it is made as [ cover / by the 2nd case 31 ]. Various information, such as the telephone number and telephone directory data which were inputted by the actuation key group 33, a received image, a dc-battery residue, and a field strength display, is displayed on the inside LCD 22.

[0018] In addition, the information group of for example, music relation is also displayed on this inside LCD 22. The information group of this music relation consists of two or more information, such as information (playback time amount, operating state, music name, etc.) for example, about music playback, and an image relevant to that music. The information group displayed on these insides LCD 22 is hereafter called comprehensive information. LCD of the large-sized size in which this inside LCD 22 has for example, 100 possible character representation is used. It is used in order to form the loudspeaker 23 in the case side near the upper part of the inside LCD 22, for example, to carry out [ voice / of a phase hand ] an external output at the time of a message. The antenna 25 which can be expanded and contracted is formed in the upper limit of the 1st case 21, and this antenna 25 is used in order to perform the base station etc. and carrier transmission which are not illustrated.

[0019] And the outside LCD 32 is established in the tooth back of the 1st case 21. Thereby, a user (user) can view the inside LCD 22 of the 1st case 21, without changing a view for the outside LCD 32 of the 1st case 21 at the time of a closed state, when the 1st case 21 is in an open condition to the 2nd case 31. The selection information which is a part of comprehensive information displayed on the inside LCD 22 is displayed on this outside LCD 32. This selection information is the information for example, on music playback time amount, the telephone number of the phase hand who received, etc. For this reason, LCD of size smaller than the inside LCD 22 can be used for an outside LCD 32.

[0020] The selection information displayed on this outside LCD 32 is beforehand made by arbitration as it is selectable, because a user operates 3D jog dial 26 prepared in the side face of the 1st case 21. Rotation actuation, the push operation to 1st case 21 direction, and the push operation to the direction of a tooth back of the 1st case 21 are possible for it, for example, this 3D jog dial 26 carries out rotation actuation of the 3D jog dial 26, and selection information can be switched to a music name from playback time amount, or it can also scroll the contents of information. Of course, the same function as the telephone directory key of the actuation key group 33, a speaking key, a selection decision key, etc. may be given to this 3D jog dial 26, and selection information may be set up by the actuation key group 33.

[0021] Moreover, the depression-type switching condition detection switch 51 is formed near [ in the transverse plane of the 1st case 21 ] upper limit, and the height 52 protrudes on the transverse plane of the 2nd case 31 which counters this switching condition detection switch 51. The off contact method is adopted and this switching condition detection switch 51 is made as [ turn / case / the 1st case 21 is pushed on a height 52 to the 2nd case 31 at the time of a closed state, and ]. Furthermore, the covering condition detection switch 53 of a magnetic formula is laid under the transverse plane of the 1st case 21 in the hinge region 11 neighborhood, and the magnet 54 is formed in the transverse plane of the 2nd case 31 which counters this covering condition detection switch 53.

[0022] The off contact method is adopted also for this covering condition detection switch 53. The covering condition detection switch 53 is made as [ turn / with a magnet 54 ], when [ at which the inside

LCD 22 disappears when this 1st case 21 shifts to a closed state ] a user counters the transverse plane of the 2nd case 31 of an open condition, and views the inside LCD 22, and the closing motion angle  $\theta$  is  $\theta \leq 90$  [\*\*], for example. These switching condition detection switch 51 and the covering condition detection switch 53 are connected to CPU (Central Processing Unit) which was prepared in the 2nd case and which is not illustrated, and this CPU carries out change-over control of the information displayed on the inside LCD 22 and an outside LCD 32.

[0023] In addition, what is necessary is not to be limited to this, of course and just to do the same effectiveness so, although the switching condition of the 1st case 21 and the 2nd case 31 was detected here with the depression-type closing motion detection switch 51 and the covering condition detection switch 53 of magneto system. For example, the rotation detection switch which detects the angle of rotation of the 2nd case 31 to the 1st case 21 may be formed in the interior of a hinge region 11, and a switching condition may be detected. moreover -- here -- not illustrating, either -- a voice regenerative apparatus, a transmitter-receiver, etc. are folded up and it is prepared in the interior of a case 10.

[0024] Drawing 2 is the block diagram showing the example of a configuration of the control system 150 in the \*\*\*\* type portable telephone machine 100. As shown in drawing 2, the control system 150 has CPU40, the inside LCD 22, an outside LCD 32, the switching condition detection switch 51, the covering condition detection switch 53, and RAM (Random Access Memory)60. The inside LCD 22, an outside LCD 32, the switching condition detection switch 51, the covering condition detection switch 53, and RAM60 are connected to CPU40.

[0025] This CPU40 carries out change-over control of the information which recognizes the switching condition of the folding case 10 and is displayed on the inside LCD 22 and an outside LCD 32 based on turning on and off of the switching condition detection switch 51 and the covering condition detection switch 53. When the switching condition detection switch 51 is turned on, it controls by CPU40 to fold up, to recognize the closing motion angle  $\theta = 0$  of a case 10 [\*\*], and to display information on an outside LCD 32. When the switching condition detection switch 51 is turned off, it controls by CPU40 to recognize the closing motion angle  $\theta > 0$  [\*\*], and to display information on the inside LCD 22. In CPU40, such control is considered as fundamental change-over control, and, in addition to this fundamental change-over control, the following interrupt control is performed.

[0026] This CPU40 is equipped with the timer function which operates based on turning on and off of the switching condition detection switch 51 or the covering condition detection switch 53, and it controls it so that between predetermined time (for example, 3 [sec] etc.) displays information that this timer function operates on the inside LCD 22 and the outside LCD 32. If the switching condition detection switch 51 shifts off from ON, it will control by this CPU40 so that a timer function is operated and between predetermined time displays information on the inside LCD 22 and an outside LCD 32.

[0027] Moreover, if the covering condition detection switch 53 is turned on from OFF, it will control by CPU40 so that a timer function is operated and between predetermined time displays information on the inside LCD 22 and an outside LCD 32. And in CPU40, fundamental change-over control mentioned above based on turning on and off of the switching condition detection switch 51 and the covering condition detection switch 53 is performed after timer expiration.

[0028] Furthermore, CPU40 carries out memory of the comprehensive information (for example, music-related information group etc.) displayed on the inside LCD 22 to RAM60 at any time. When carrying out change-over control of the information from the inside LCD 22 on the outside LCD 32, it controls by CPU40 to display the predetermined selection information (for example, information on music playback time amount etc.) beforehand chosen by the user from the comprehensive information by which memory was carried out on an outside LCD 32. The comprehensive information by which memory was carried out to RAM60 at this time is interlocked with the predetermined selection information displayed on the outside LCD 32, and renewal of sequential is carried out.

[0029] Moreover, in CPU40, when carrying out change-over control of the information from an outside LCD 32 at the inside LCD 22, change-over control is carried out so that the comprehensive information which becomes the origin of the selection information displayed on the outside LCD 32 and by which memory was carried out to RAM60 may be displayed on the inside LCD 22. in addition -- here -- not

illustrating, either -- ROM (Read Only Memory) and the music regenerative apparatus with which the control program of CPU40 etc. was stored, the transmitter-receiver, the dc-battery, etc. are formed in the control system 150 concerned.

[0030] Next, the example of the \*\*\*\* type portable telephone machine 100 of this invention of operation is explained.

[0031] Drawing 3 is a flow chart which shows the example (at the time of an open operation) of the \*\*\*\* type portable telephone machine 100 of operation. In addition, it is [ music regenerative function ] under use here, and is premised on making the folding case 10 shift to the open condition of the closing motion angle  $\theta = 150$  [\*\*] from the closed state of the closing motion angle  $\theta = 0$  [\*\*]. First, by the closed state, the switching condition detection switch 51 is pushed on a height 52 for the folding case 10, and information is displayed on an outside LCD 32 by CPU40.

[0032] At this time, CPU40 is controlled to display selection information (for example, information on music playback time amount etc.) on the exterior LCD 32 out of the comprehensive information (for example, information group of the music relation which consists of music playback time amount, a music name, a playback condition, etc.) which carried out memory to RAM60. And the user is viewing the selection information displayed on this outside LCD 32. In addition, the selection information displayed on the outside LCD 32 is beforehand set as the information on desired by the user with 3D jog dial 26.

[0033] It stands by by CPU40 until the switching condition detection switch 51 is turned off at step A1, as shown in drawing 3. If a user makes the folding case 10 of a closed state shift to an open condition, the switching condition detection switch 51 will be turned off and it will progress to step A2. At this step A2, while being controlled by CPU40 to display comprehensive information on the inside LCD 22, and to display selection information on an outside LCD 32, the timer for 3 seconds is started, for example.

[0034] Then, in step A3, whether the timer for 3 seconds expired stands by, and the selection information displayed on the comprehensive information displayed on the inside LCD 22 and an outside LCD 32 is held by CPU40 until a timer expires. Even if it becomes impossible to view Outside LCD with open actuation of the 1st case 21 by this, a user can check continuously, without missing the selection information displayed on the outside LCD 32 in the inside LCD 22.

[0035] And if the timer for 3 seconds expires, it will progress to step A4. In this step A4, it is distinguished by CPU40 whether the switching condition detection switch 51 was turned on. The switching condition detection switch 51 progresses to step A5, when OFF 10, i.e., a folding case, shifts to an open condition completely. In this step A5, it is turned off by CPU40, and change-over control will be carried out and a display on the outside LCD 32 will be the display of the inside LCD 22 with an end.

[0036] Moreover, when ON 10, i.e., a folding case, shifts to an open condition from a closed state in step A4 and the switching condition detection switch 51 shifts to a closed state again within a timer actuation period, it progresses to step A6. At this step A6, it is turned off by CPU40, and change-over control will be carried out and the display to the inside LCD 22 will be the display of an outside LCD 32 with an end.

[0037] Drawing 4 is a flow chart which shows the example (at the time of fold-up actuation) of the \*\*\*\* type portable telephone machine 100 of operation. In addition, it is [ music regenerative function ] for example, under use here, and is premised on a user folding up and making a case 10 shift to the closed state of the closing motion angle  $\theta = 0$  [\*\*] from the open condition of the closing motion angle  $\theta = 150$  [\*\*]. Since the folding case 10 is in an open condition at this time, the switching condition detection switch 51 becomes off, and CPU40 is controlled to display the comprehensive information (for example, information group of the music relation which consists of music playback time amount, a music name, a playback condition, etc.) which carried out memory to RAM60 on the inside LCD 22. The user is viewing the comprehensive information displayed on this inside LCD 22. Moreover, a user operates 3D jog dial 26 here, and selection information is set up beforehand.

[0038] It stands by by CPU40 until the covering condition detection switch 53 is turned on at step B1, as

shown in drawing 4 . If the folding case 10 of an open condition shifts to a closed state and serves as the closing motion angle  $\theta \leq 90$  [°] by the user, the covering condition detection switch 53 will be turned on with a magnet 54, and will progress to step B-2. In this step B-2, while change-over control is carried out by CPU40 so that the selection information (for example, information on music playback time amount etc.) which is a part of comprehensive information about comprehensive information on the outside LCD 32 may be displayed on the inside LCD 22, the timer for 3 seconds is started, for example. [0039] Then, at step B3, whether the timer for 3 seconds expired stands by, and the selection information displayed on the comprehensive information displayed on the inside LCD 22 and an outside LCD 32 is held by CPU40 until a timer expires. Even if it becomes impossible to view the inside LCD 22 with closed actuation of the 1st case 21 by this, a user can check continuously on the outside LCD 32, without missing the selection information which is a part of comprehensive information displayed on the inside LCD 22.

[0040] And if the timer for 3 seconds expires, it will progress to step B4. In this step B4, it is distinguished by CPU40 whether the switching condition detection switch 51 was turned on. The switching condition detection switch 51 progresses to step B5, when ON 10, i.e., a folding case, shifts to a closed state completely. In this step B5, it is turned off by CPU40, and change-over control will be carried out and the display to the inside LCD 22 will be the display of an outside LCD 32 with an end. [0041] Moreover, when OFF 10, i.e., a folding case, shifts to a closed state from an open condition in step B4 and the switching condition detection switch 51 shifts to an open condition again within a timer actuation period, it progresses to step B6. In this step B6, it is turned off by CPU40, and change-over control will be carried out and a display on the outside LCD 32 will be the display of the inside LCD 22 with an end.

[0042] In addition, in the example of operation mentioned above, also when a message function is used although the case where a music regenerative function was used was explained for example, the same effectiveness can be acquired. Moreover, it is also possible to switch the display information on an outside LCD 32 by operating 3D jog dial 26.

[0043] Drawing 5 is a perspective view at the time of the (b) closed state at the time of (a) open condition which shows the example of a condition of the \*\*\*\* type portable telephone machine 100. If the 1st case 21 is folded up to the 2nd case 31 in the \*\*\*\* type portable telephone machine 100 of an open condition as shown in drawing 5 (a), it will be in a compact condition like drawing 5 (b). At this time, although the inside LCD 22 is covered with the transverse plane of the 2nd case 31 and it becomes impossible to view it instead, viewing of it is attained, without the outside LCD 32 established in the tooth back of the 1st case 21 changing a view. And it is controlled to always display information on LCD in which this viewing is possible.

[0044] Thus, according to the \*\*\*\* type portable telephone machine 100 as the 1st operation gestalt CPU40 is formed in the inside insertion side at the time of a closed state at the folding case 10 with the inside LCD 22 and the outside LCD 32 of the viewing area smaller than the inside LCD 22 to the opposite side of the inside insertion side. When the covering condition detection switch 53 shifts to ON from OFF off [ the switching condition detection switch 51 ] from ON Since CPU40 performs a display control so that only a predetermined period may display the selection information chosen with 3D jog dial 26 from the comprehensive information beforehand displayed on the inside LCD 22 on the inside LCD 22 and an outside LCD 32 The inside LCD 22 used in an open condition can be made to display only required information on the outside LCD 32 used in much information at the time of a closed state.

[0045] Therefore, the power consumption in a closed state can be reduced. In addition, since the information can be continued and viewed by the display of another side even if it is the case where the display folded up and while information was displayed is covered with closing motion of a case, it can fold up without missing the displayed information, and a case can be opened and closed.

[0046] (The 2nd operation gestalt) Drawing 6 is the perspective view showing the example of a configuration of the \*\*\*\* type portable telephone machine 200 as the 2nd operation gestalt concerning this invention. The outside LCD 32 in the 1st operation gestalt is established in the tooth back of the 2nd case 31, and when the closing motion angle  $\theta$  of the folding case 10 is located in the predetermined



closing motion section, information is expressed on the inside LCD 22 and the outside LCD 32 as this operation gestalt. In addition, since the thing of the same name as the 1st operation gestalt and a sign has the same function, it omits the explanation.

[0047] The \*\*\*\* type portable telephone machine 200 shown in drawing 6 is a personal digital assistant equipped with the Internet function, the music regenerative function, etc. as well as the message function as a telephone. The \*\*\*\* type portable telephone machine 200 has the closing motion-type folding case 10, and this folding case 10 consists of the 1st case 21, the 2nd case 31, and a hinge region 11. The lower limit of 1st case 21 longitudinal direction and the upper limit of 2nd case 31 longitudinal direction are connected free [ rotation ] by the hinge region 11. Thereby, the 1st case 21 and the 2nd case 31 counter in transverse planes mutually, and are made as folding is possible. Here, the closing motion angle  $\theta$  of the 1st case 21 and the 2nd case 31 is designed so that it may become for example,  $0 \leq \theta \leq 150$  [\*\*] extent.

[0048] The inside LCD 22 is formed in the transverse plane of this 1st case 21, and when the folding case 10 is a closed state, it is made as [ cover / by the 2nd case 31 ]. The loudspeaker 23 is formed in the case side near the upper part of this inside LCD 22. The antenna 25 which can be expanded and contracted is formed in the upper limit of the 1st case 21. 3D jog dial 26 is formed in the side face of the 1st case 21.

[0049] And the actuation key group 33 is formed in the transverse plane of the 2nd case 31. The microphone 34 is formed in the case side near the lower part of the actuation key group 33. LCD32 is formed in the tooth back of the 2nd case 31. Thereby, a user (user) can view the inside LCD 22 of the 1st case 21, without changing a view for the outside LCD 32 of the 2nd case 31 at the time of a closed state, when the 2nd case 31 is in an open condition to the 1st case 21.

[0050] Moreover, the depression-type switching condition detection switch 51 is formed near [ in the transverse plane of the 1st case 21 ] upper limit, and the height 52 protrudes on the transverse plane of the 2nd case 31 which counters this switching condition detection switch 51. Furthermore, the covering condition detection switch 53 of a magnetic formula is laid under the transverse plane of the 1st case 21 in the hinge region 11 neighborhood, and the magnet 54 is formed in the transverse plane of the 2nd case 31 which counters this covering condition detection switch 53.

[0051] Drawing 7 is the block diagram showing the example of a configuration of the control system 250 in the \*\*\*\* type portable telephone machine 200. As shown in drawing 7, the control system 250 has CPU240, the inside LCD 22, an outside LCD 32, the switching condition detection switch 51, the covering condition detection switch 53, and RAM60. The inside LCD 22, an outside LCD 32, the switching condition detection switch 51, the covering condition detection switch 53, and RAM60 are connected to CPU240.

[0052] When the switching condition detection switch 51 is turned on, it controls by this CPU240 to recognize the closing motion angle  $\theta = 0$  [\*\*] in the folding case 10, and to display information on an outside LCD 32. It controls for the switching condition detection switch 51 to fold up in CPU240, when OFF and the covering condition detection switch 53 are turned on, and to recognize  $0 < \text{closing motion angle } \theta \leq 90$  [\*\*] in a case 10, and to display information on an outside LCD 32 and the inside LCD 22. It controls for the switching condition detection switch 51 to fold up in CPU240, when OFF and the covering condition detection switch 53 are turned off, and to recognize  $90 < \text{closing motion angle } \theta \leq 150$  [\*\*] in a case 10, and to display information on the inside LCD 22.

[0053] Furthermore, CPU240 carries out memory of the comprehensive information (for example, music-related information group etc.) displayed on the inside LCD 22 to RAM60 at any time. When carrying out change-over control of the information from the inside LCD 22 on the outside LCD 32, it controls by CPU240 to display the predetermined selection information (for example, information on music playback time amount etc.) beforehand chosen by the user from the comprehensive information by which memory was carried out on an outside LCD 32. The comprehensive information by which memory was carried out to RAM60 at this time is interlocked with the predetermined selection information displayed on the outside LCD 32, and renewal of sequential is carried out.

[0054] Moreover, in CPU240, when carrying out change-over control of the information from an outside

LCD 32 at the inside LCD 22, change-over control is carried out so that the comprehensive information which becomes the origin of the selection information displayed on the outside LCD 32 and by which memory was carried out to RAM60 may be displayed on the inside LCD 22. in addition -- here -- not illustrating, either -- ROM and the music regenerative apparatus with which the control program of CPU240 etc. was stored, the transmitter-receiver, the dc-battery, etc. are formed in the control system 250 concerned.

[0055] Next, the example of the \*\*\*\* type portable telephone machine 200 of the 2nd operation gestalt of operation is explained.

[0056] Drawing 8 is a flow chart which shows the example of the \*\*\*\* type portable telephone machine 200 of operation. In addition, it is premised on the user having set up selection information out of comprehensive information with 3D jog dial 26 beforehand here. As shown in drawing 8, at step C1, turning on and off of the switching condition detection switch 51 is distinguished by CPU240. If the switching condition detection switch 51 is ON, the closing motion angle  $\theta = 0$  [\*\*] will be recognized by CPU240, and will progress to step C2. At this step C2, selection information is displayed on an outside LCD 32 by CPU240, and it becomes an end by it.

[0057] Moreover, at step C1, if the switching condition detection switch 51 is off, it will progress to step C3. At this step C3, turning on and off of the covering condition detection switch 53 is distinguished by CPU240. If the covering condition detection switch 53 is ON,  $0 < \text{closing motion angle } \theta \leq 90$  [\*\*] will be recognized by CPU240, and will progress to step C4. At this step C4, selection information is displayed on an outside LCD 32, comprehensive information is displayed on the inside LCD 22 by CPU240, and it becomes an end by it.

[0058] Moreover, at step C3, if the covering condition detection switch 53 is off,  $90 < \text{closing motion angle } \theta \leq 150$  [\*\*] will be recognized by CPU240, and it progresses to step C5. At this step C5, comprehensive information is displayed on the inside LCD 22, and it becomes an end.

[0059] Drawing 9 is a perspective view at the time of the (b) closed state at the time of (a) open condition which shows the example of a condition of the \*\*\*\* type portable telephone machine 200. If the 2nd case 31 is folded up to the 1st case 21 in the \*\*\*\* type portable telephone machine 200 of an open condition as shown in drawing 7 (a), it will be in a compact condition like drawing 7 (b). At this time, although the inside LCD 22 is covered with the transverse plane of the 2nd case 31 and it becomes impossible to view it instead, viewing of it is attained, without the outside LCD 32 established in the tooth back of the 2nd case 31 changing a view. And it is controlled to always display information on LCD in which this viewing is possible.

[0060] Thus, according to the \*\*\*\* type portable telephone machine 200 as the 2nd operation gestalt, the same effectiveness as the \*\*\*\* type portable telephone machine 100 of the 1st operation gestalt can be acquired. When carrying out switching operation of the 1st case 21 to the 2nd case 31 especially with the \*\*\*\* type portable telephone vessel 100, it is the optimal, but it is the optimal when carrying out switching operation of the 2nd case 31 to the 1st case 21 with the \*\*\*\* type portable telephone vessel 200.

[0061]

[Effect of the Invention] As explained above, according to this invention, a control means is prepared in the inside insertion side at the time of a closed state at a folding case with the 1st display and the 2nd display of the viewing area smaller than the 1st display to the opposite side of the inside insertion side. A control means is made to perform a display control so that only a predetermined period may display the same preselected information on the 1st display and 2nd display based on the detection result of a condition detection means to detect the switching condition of a fold-up case.

[0062] The 1st display used in an open condition can be made to display only required information on the 2nd display used in much information at the time of a closed state by this configuration.

[0063] Therefore, the power consumption in a closed state can be reduced. In addition, since the information can be continued and viewed by the display of another side even if it is the case where the display folded up and while information was displayed is covered with closing motion of a case, it can fold up without missing the displayed information, and a case can be opened and closed.

[0064] This invention is applied to \*\*\*\* type portable electronic devices, such as a portable telephone machine with which it is the case of a \*\*\*\* type with which LCD used at the time of a closed state and LCD used in an open condition were prepared, and the music regenerative function was given, and is very suitable.

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[Translation done.]